

Fig. 1

Genotype:

object parameter	step size
α	0.001
β	0.001
γ	0.001
η	0.001
λ	0.001
μ	0.001
ν	0.001
ω	0.001
ξ	0.001
ζ	0.001
θ	0.001
ϕ	0.001
ψ	0.001
χ	0.001
ψ	0.001
ω	0.001
ξ	0.001
ζ	0.001
θ	0.001
ϕ	0.001
ψ	0.001
χ	0.001
ψ	0.001
ω	0.001
ξ	0.001
ζ	0.001
θ	0.001
ϕ	0.001
ψ	0.001
χ	0.001
ψ	0.001
ω	0.001
ξ	0.001
ζ	0.001
θ	0.001
ϕ	0.001
ψ	0.001
χ	0.001
ψ	0.001
ω	0.001
ξ	0.001
ζ	0.001
θ	0.001
ϕ	0.001
ψ	0.001
χ	0.001
ψ	0.001
ω	0.001
ξ	0.001
ζ	0.001
θ	0.001
ϕ	0.001
ψ	0.001
χ	0.001
ψ	0.001
ω	0.001
ξ	0.001
ζ	0.001
θ	0.001
ϕ	0.001
ψ	0.001
χ	0.001
ψ	0.001
ω	0.001
ξ	0.001
ζ	0.001
θ	0.001
ϕ	0.001
ψ	0.001
χ	0.001
ψ	0.001
ω	0.001
ξ	0.001
ζ	0.001
θ	0.001
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ψ	0.001
χ	0.001
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χ	0.001
ψ	0.001
ω	0.001
ξ	0.001
ζ	0.001
θ	0.001
ϕ	0.001
ψ	0.001
χ	0.001
ψ	0.001
ω	0.001
ξ	0.001
ζ	0.001
θ	0.001
$\phi</$	



offspring distribution after mutation

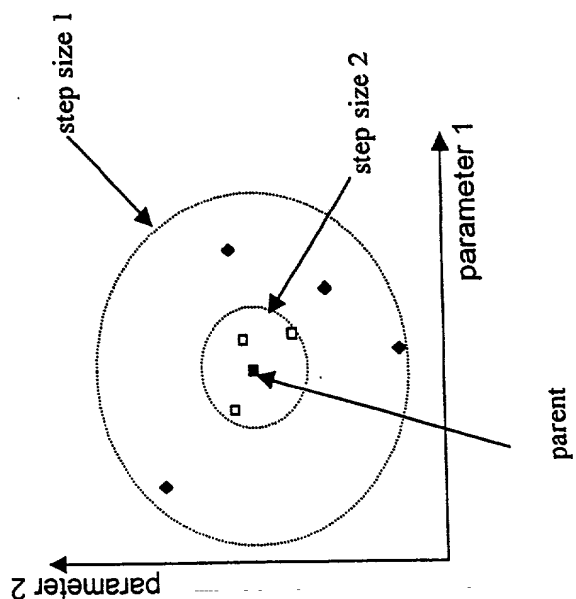


Fig. 2

object parameter strategy parameter

$$\vec{x}^0 = \vec{x}^p + \vec{\delta}$$

$$\vec{\delta} \sim \frac{1}{(2\pi)^{n/2}} \det(\Sigma^{-1}) \exp \left(-\frac{1}{2} (\vec{x} - \vec{\mu})^T \Sigma^{-1} (\vec{x} - \vec{\mu}) \right)$$

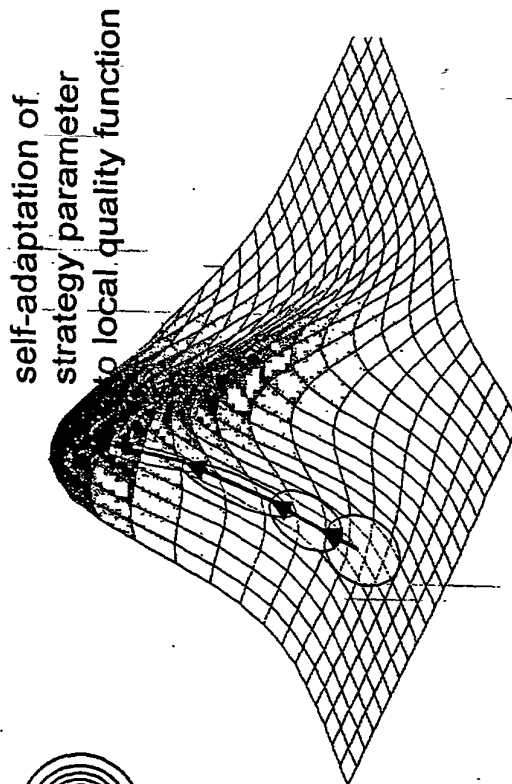
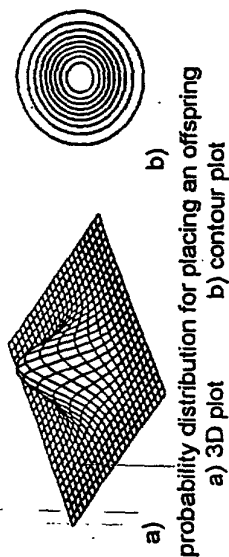


Fig.3

structure mutation of individual step-sizes

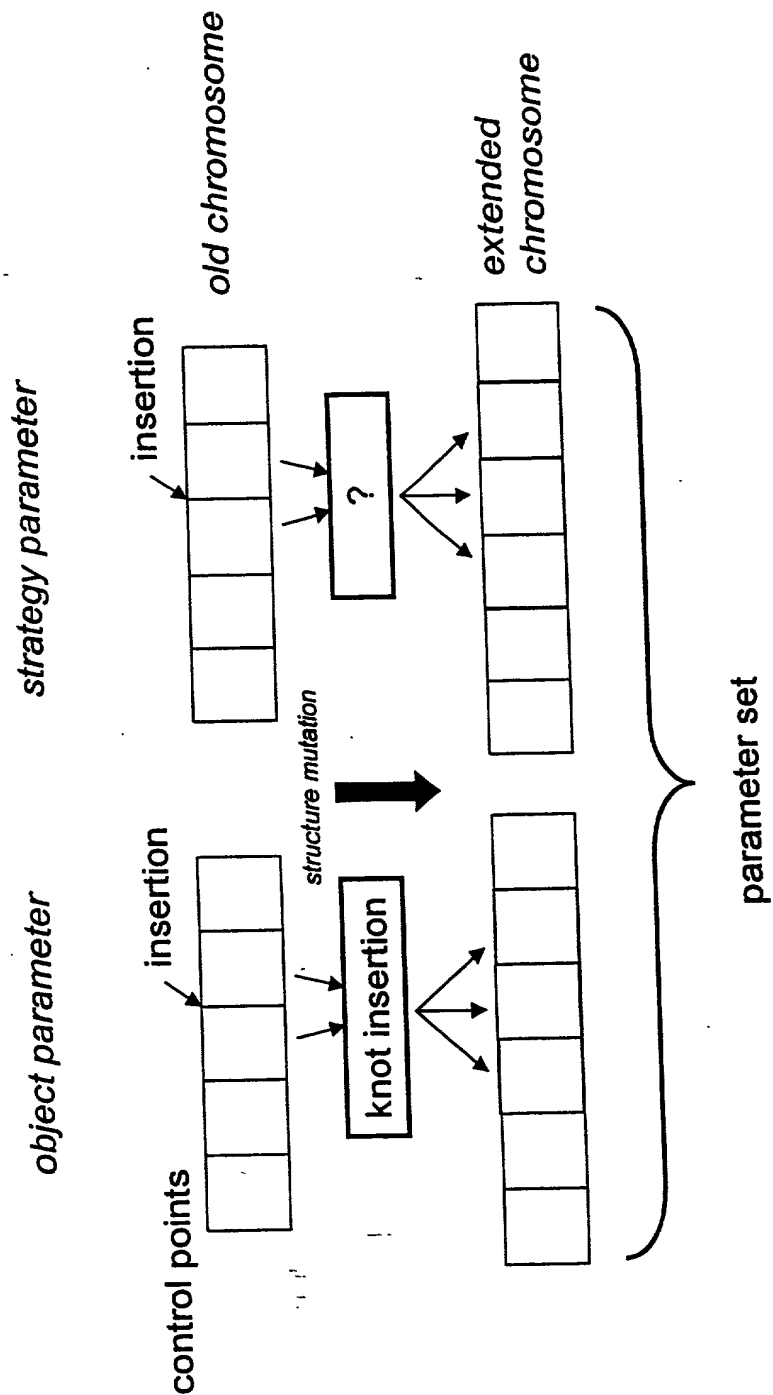


Fig. 4

structure mutation of the covariance matrix

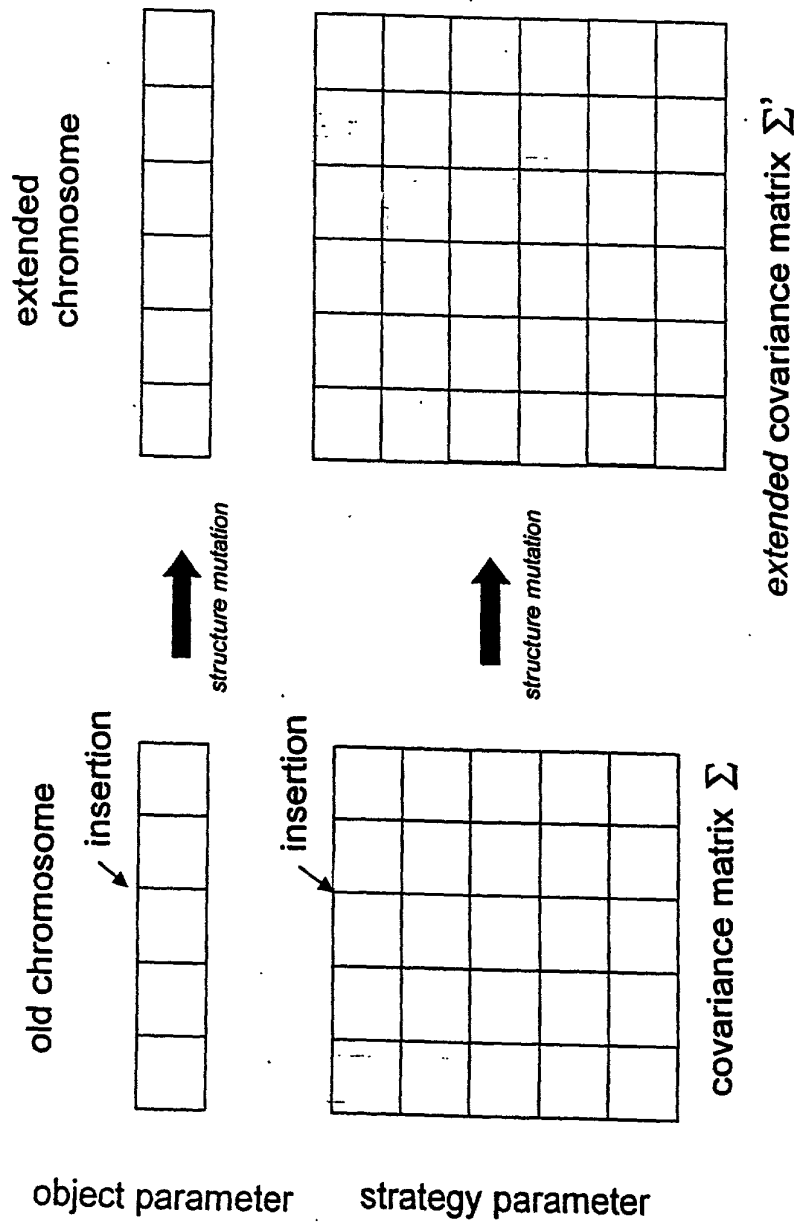


Fig.5

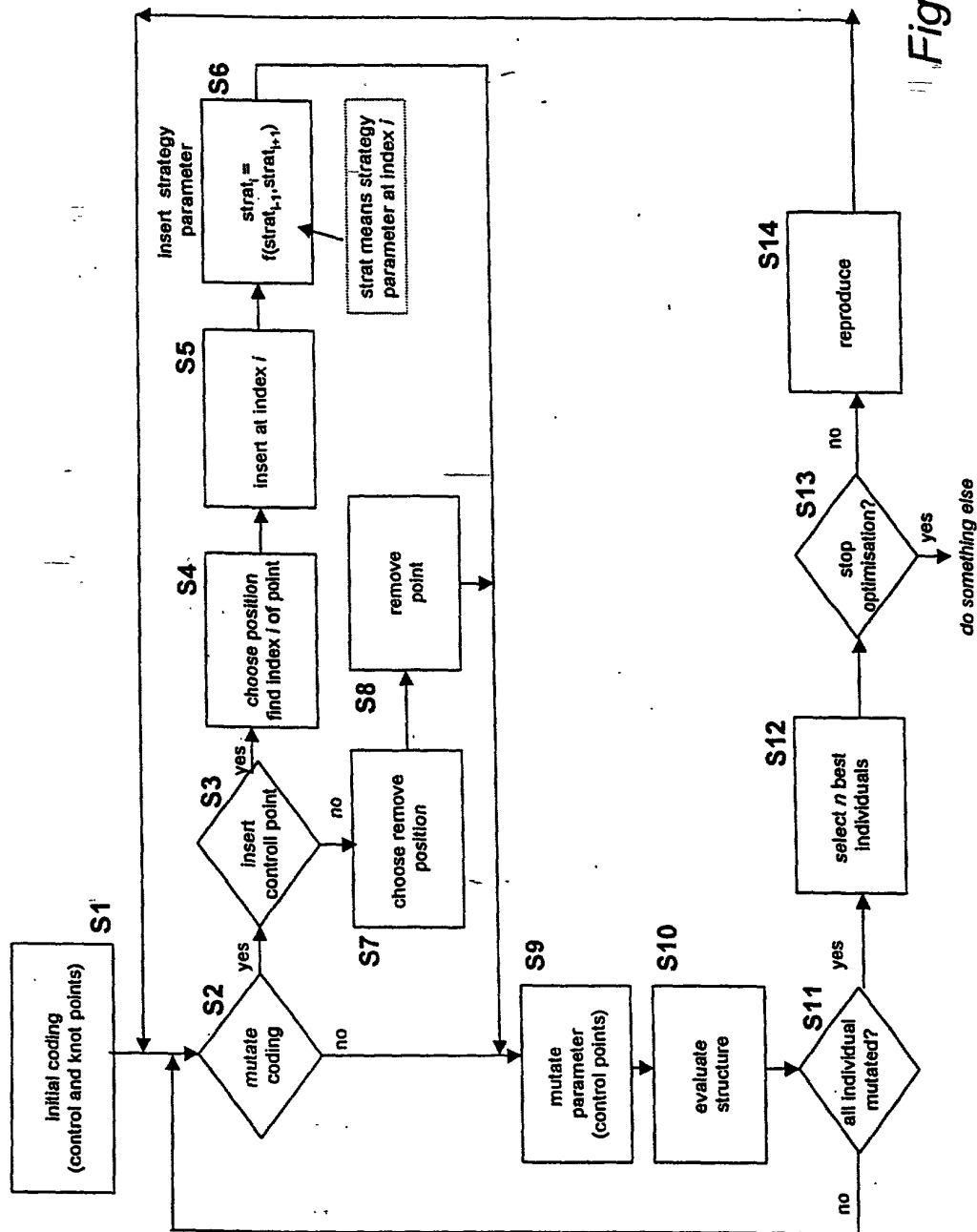


Fig. 6

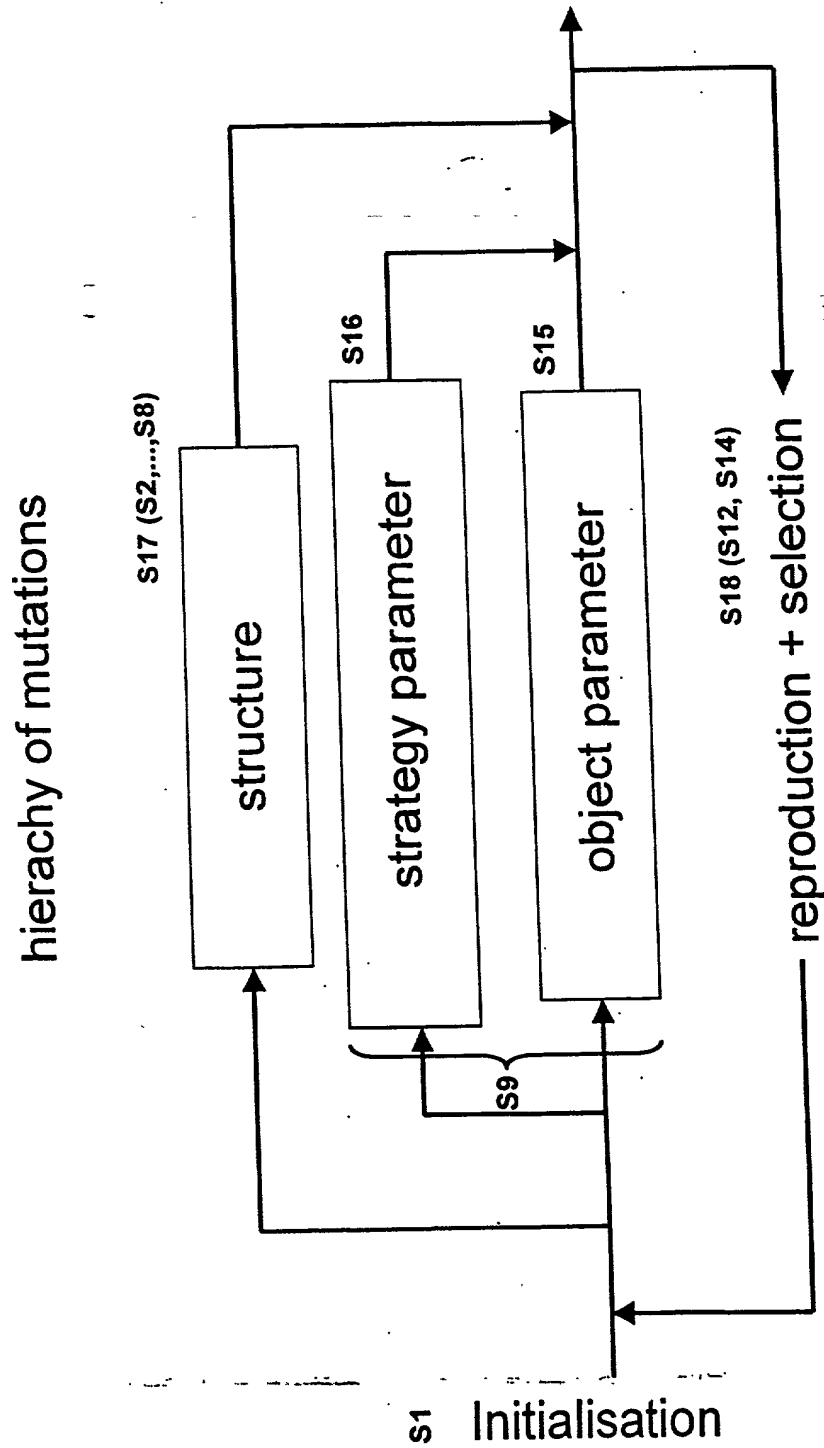


Fig.7

extension of strategy parameter set

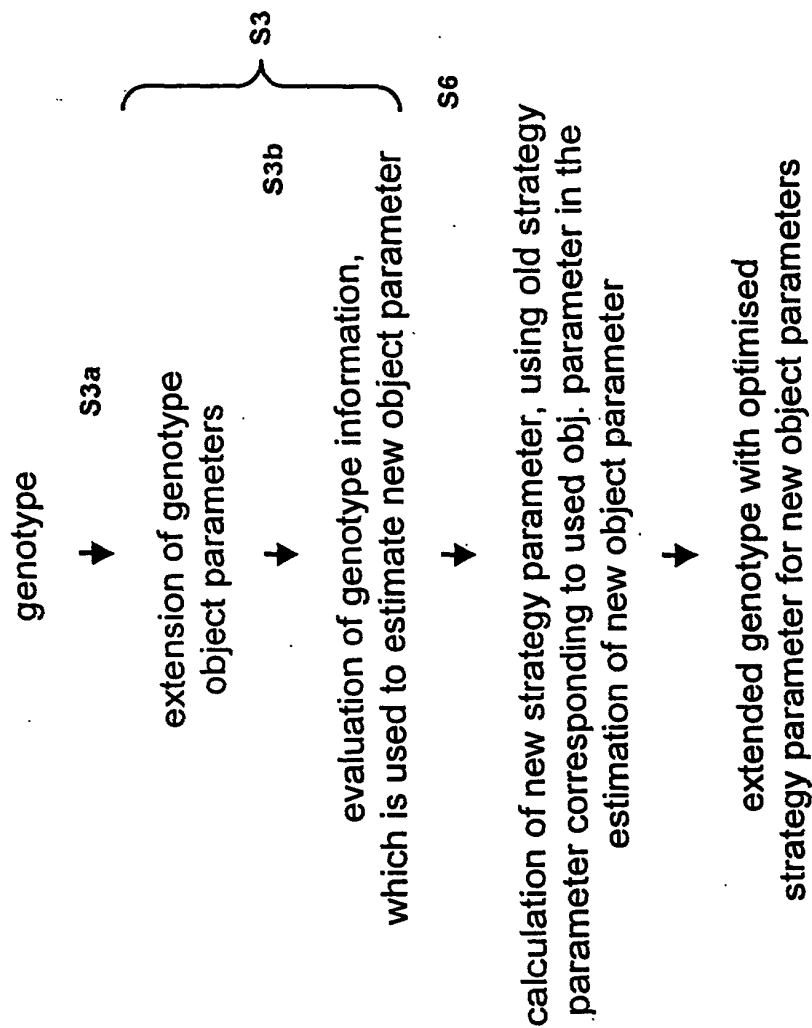
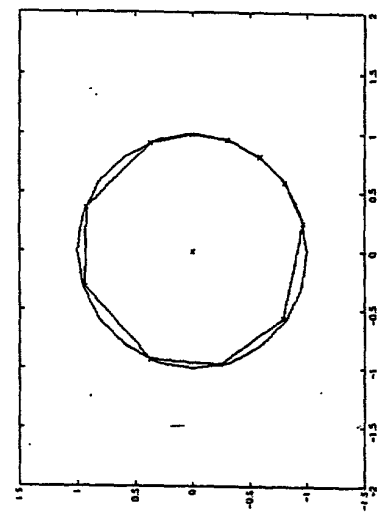


Fig. 8

dynamic, incremental parameter
set with structure mutations



static, large parameter set

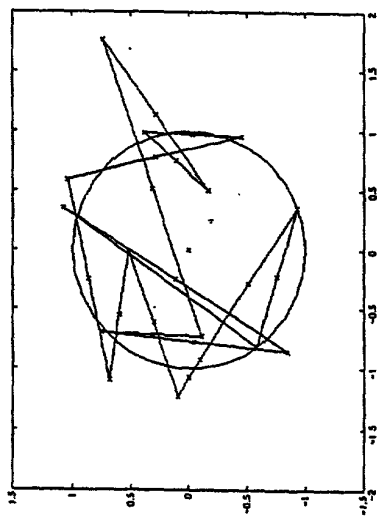


Fig.9

Fig.10

Visualisation of the estimation of strategy parameters

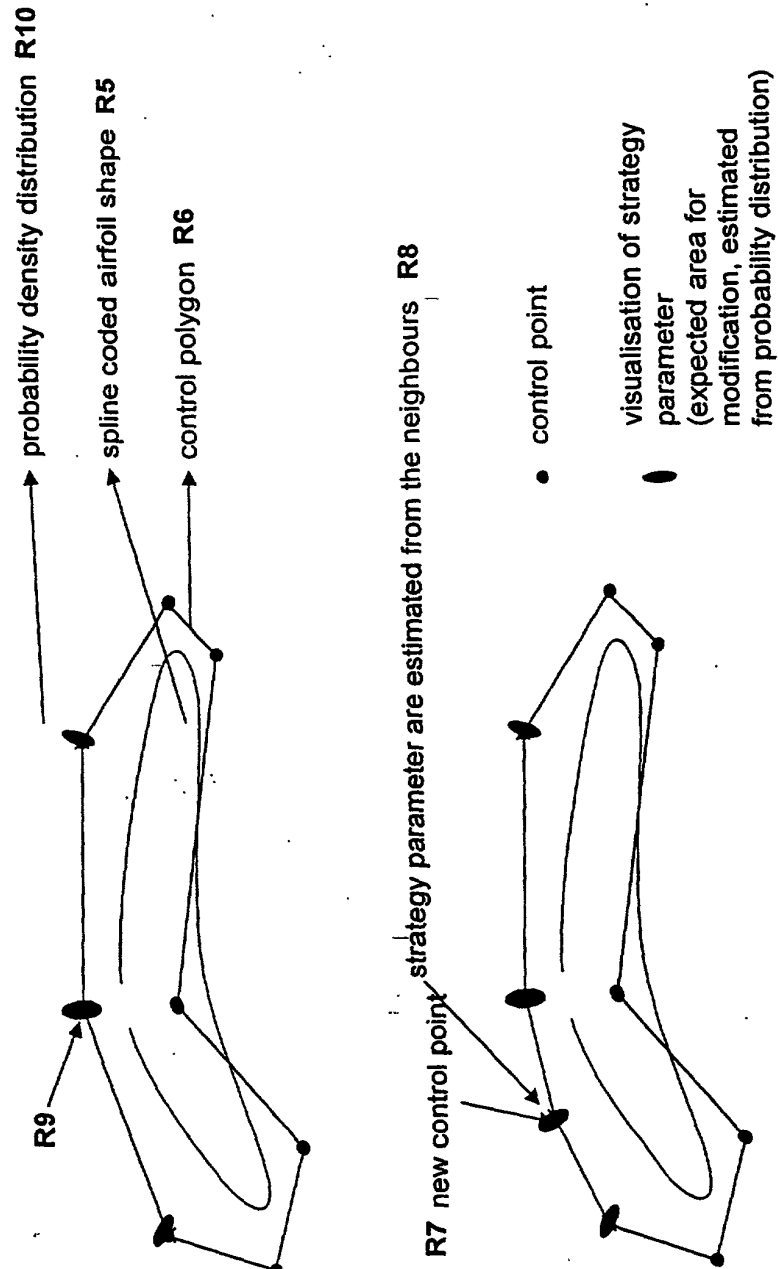


Fig.11